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EXAMINER

WOZNIAK, JAMES S

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/749,544	Applicant(s) SUNG ET AL.	
	Examiner James S. Wozniak	Art Unit 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-7 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. **Claims 1-7** are objected to because of the following informalities:

In claim 1, line 2, “encode” should be changed to --encoder--.

In claim 1, the acronyms “LPC” (linear prediction coding) and “ISP” (immitance spectral pairs) should be expanded to clarify their meaning in the claim.

In claim 3, line 2, “the two indexes transmitted” should be changed to --two indexes transmitted-- in order to provide proper antecedent basis for the limitation in the claim.

In claim 3, line 4, “the second index” should be changed to --a second index- in order to provide proper antecedent basis for the limitation in the claim.

The remainder of the dependent claims fail to overcome the objections directed toward independent claim 1, and thus, are also objected to due to minor informalities.

Appropriate correction is required.

Drawings

2. **Figures 1-4** should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37

CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "Apparatus for Coding Wide-Band Low Bit Rate Speech Signal Using a Random Vector Generator".

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claim 1** is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: a seed generator that generates a seed value in response to two indexes transmitted from the LPC analysis and ISP quantization unit; and the recitation that the claimed random vector generation block generates the random vector for modeling the excitation signal in response to the generated seed value. As seen in Fig. 5 (*Elements 504 and 506*), the random vector cannot be generated without a seed value. Thus, the seed generator is an

omitted essential element. Dependent **claims 2-7** fail to overcome the rejection directed towards claim 1, and thus, are also rejected under 35 U.S.C. 112, second paragraph.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claims 1-3 and 5** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bessette et al (*U.S. Patent: 7,191,123*) in view of Yasunaga et al (*U.S. Patent: 6,330,534*).

With respect to **Claim 1**, Bessette discloses:

A pre-processing and down-sampling unit, which down-samples a speech signal frame sampled at a high frequency, at a low frequency, and outputs a speech signal frame without DC components (*down sampling module and high pass filter to remove unwanted low frequency sound components, Col. 8, Lines 1-20*);

A LPC analysis and ISP quantization unit, which receives the down-sampled speech signal, determines a linear prediction coefficient of the received speech signal frame, converts the linear prediction coefficient into an ISP coefficient, quantizes the converted result, and outputs an index of the ISP coefficient (*LP analysis module and immitance spectral parameter (ISP) domain quantizer, Col. 8, Lines 44- Col. 9, Line 13; codebook indices, Col. 7, Lines 25-57*);

A residual signal calculation unit, which calculates a residual signal that models an excitation signal of a synthesis filter for the down-sampled speech signal (*means for determining an excitation signal, Col. 14, Lines 5-38*);

A gain calculation block, which calculates a gain for scaling a vector (*gain selection means, Col. 14, Lines 5-38*); and

A gain quantization block, which quantizes the gain and creates an index of the gain (*gain encoding, Col. 14, Lines 5-38*).

Bessette does not disclose the use of a random vector generator and calculating, quantizing, and indexing a gain for the random vector. Yasunaga, however, discloses a speech encoder that features a converting means for converting an LPC coefficient into a LSP parameter (*which is similar to the ISP parameter- see Bessette, Col. 8, Line 67- Col. 9, Line 14*) to output an LSP index (*Col. 12, Line 61- Col. 13, Line 16*), a random excitation vector generator (*Col. 20, Line 60- Col. 21, Line 42; and Col. 6, Lines 12-53*), and a gain quantizer (*Col. 25, Line 16- Col. 26, Line 24*).

Bessette and Yasunaga are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Bessette with the random vector generator taught by Yasunaga in order to decrease speech coder memory capacity and improve speech quality (*Yasunaga, Col. 4, Lines 59-64*).

With respect to **Claim 2**, Bessette discloses excitation modeling performed for two subframes (*Col. 10, Lines 39-49; and col. 14, Lines 5-38*), while Yasunaga discloses the random excitation vector generator and associated gain as applied to Claim 1.

With respect to **Claim 3**, Yasunaga further discloses:

The random vector is generated by storing a seed generated by a predetermined method for each of the sub-frames (*seed storage and excitation generation method using an oscillator, Col. 6, Lines 12-41*).

With respect to **Claim 5**, Yasunaga further discloses:

The gain is calculated based on the residual signal and the random vector (*gain selected based on a residual and a random code vector, Col. 25, Line 16- Col. 26, Line 35*).

8. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Bessette et al in view of Yasunaga et al and further in view of DeMartin (*U.S. Patent: 6,775,649*).

With respect to **Claim 6**, Bessette in view of Yasunaga discloses the speech coder using an ISP index and a random vector generator as applied to Claim 1. Bessette in view of Yasunaga does not teach quantizing speech parameters and gain using 14 and 6 bits respectively, however DeMartin discloses such a quantizing scheme (*Col. 3, Lines 50-61; and Col. 5, Lines 35-41*).

Bessette, Yasunaga, and DeMartin are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Bessette in view of Yasunaga with the quantizing scheme taught by DeMartin in order to implement well known coding standards compatible with well known practical applications such as VoIP (*DeMartin, Col. 3, Lines 36-61*).

9. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over Bessette et al in view of Yasunaga et al and further in view of Agassy et al (*U.S. Patent: 6,424,940*).

With respect to **Claim 7**, Bessette in view of Yasunaga discloses the speech coder capable of gain quantization and a random vector generation as applied to Claim 1. Bessette in view of Yasunaga does not teach quantizing a gain based on subtracting a quantized prediction error for a preceding frame from the gain. Agassy, however, recites gain quantization using such a difference calculation (Col. 3, Lines 6-42).

Bessette, Yasunaga, and Agassy are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Bessette in view of Yasunaga with the gain quantization scheme taught by Agassy in order to overcome problems caused by impulses occurring in a prediction error (*Agassy, Col. 2, Lines 55-59*).

Allowable Subject Matter

10. **Claim 4** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and amended to overcome the above 35 U.S.C. 112, second paragraph rejection and minor informality objection.

11. The following is a statement of reasons for the indication of allowable subject matter:

With respect to **Claim 4**, the prior art of record does not explicitly teach or fairly suggest, either individually or in combination, a wide-band speech encoder as defined in claims 1-3, wherein seed values generated for two subframes are generated according to the process defined in claim 4 (defined in specification on Pages 9-10). Although it is well-known in the speech coding art to generate a random vector using a seed value for modeling an excitation, as is evidenced by the Yasunaga et al reference (*U.S. Patent: 6,330,534*) (*Col. 6, Lines 12-41*), the prior art does not teach a speech coder having all the elements of claim 1-3, wherein a seed value used to generate a random vector for modeling an excitation is obtained according to the process defined in claim 4.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Jacobs et al (*U.S. Patent: 5,414,796*)- discloses a pseudorandom number generator that replaces a codebook in a speech coder.

Kroon (*U.S. Patent: 5,664,055*)- discloses a speech coding method that utilizes a random generator and a seed value to model an excitation.

Yfantis (*U.S. Patent: 5,871,400*)- discloses a random number generator for electronic applications utilizing a shift register.

Honkanen et al (*U.S. Patent: 5,893,060*)- discloses a method for speech coding utilizing immitance spectral pairs.

Gao et al (*U.S. Patent: 6,574,593*)- discloses a speech coder that uses a random sequence generator to represent a short-term excitation.

Makinen et al (*U.S. Patent: 6,940,967*)- discloses a speech coding method that converts LPC parameters to ISP parameters prior to quantization.


Benyassine et al (*U.S. Patent: 7,146,309*)- discloses a speech coder that derives seed values to generate excitation values.

Bessette et al (*"The Adaptive Multirate Wideband Speech Codec (AMR-WB)," 2002*)- discloses a method for wideband speech coding utilizing ISP parameters.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632. The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached at (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



James S. Wozniak
8/29/2007